

Johnson (*loc. cit.*, p. 533), has attached great importance to the 'Degree of bifurcation'. In almost all cases the angle of bifurcation has been ascertained either by dissecting the specimens or with the help of skiagrams. With the specimen under report either of these methods could not be resorted to.

Very little information is available on the behaviour of double-headed snakes. Some authors, as Wall, Fischer<sup>1</sup> etc., observed the behaviour of abnormal specimens kept in captivity.

Heasman<sup>2</sup> who carried out anatomical investigations on a double-headed *Coluber (Zamenis) florulentus* Schlegel, has stated that as 'each head has a complete set of receptor organs, a complete brain and a normal musculature it is reasonable to suppose that the heads, being subjected to different stimuli, will behave independently'.

A very interesting account of the behaviour of a double-headed American hog-nosed snake (*Heterodon simus*), was published in the *Madras Times* in 1897. It was stated that the snake used to feed with the two heads simultaneously, and the heads sometimes fought, and at other times played with one another.

I am grateful to Dr. B. N. Chopra, Director, Zoological Survey of India, for going through the manuscript and for making some suggestions. I wish also to thank Mr. A. K. Mondul, artist, Zoological Survey of India, for the drawings he has made for this note.

ZOOLOGICAL SURVEY OF INDIA,

BENARES CANTT.,

3rd August 1945.

M. N. ACHARJI, M.Sc.

17.—ADDENDA AND CORRIGENDA TO 'THE BUTTERFLIES OF THE NILGIRIS' PUBLISHED IN VOLS. XLIV AND XLV OF THE JOURNAL.

ADDITIONS.

*New Species* :—

292. *Pathysa antiphates naira*: Recorded from the Nilgiris in July or August (Sanders).

293. *Appias paulina wardi*: Foot of the Nadgani Ghat in January (Emmet). Several from below Coonoor. (Florence).

294. *Prinoris sita*: Two from the middle of the Nadgani Ghat in July or August. (Sanders).

295. *Colotis amata modesta*: ♀ v. *albina*: Recorded from the Nilgiris by Sanders.

<sup>1</sup> Fischer, E. C., *Scientific American*, LXXV (1896).

<sup>2</sup> Heasman, W. J., *Journ. Anatomy* (Cambridge), LXVII, pp. 331, 345 (1933).

Rearrangement of local *Melanitis*:—

91. *Melanitis leda ismene*.
92. *Melanitis phedima varaha*.
93. *Melanitis zitenius* subsp. nov.
94. *Melanitis tristis* (or *M. phedima* v. *tristis*?)
296. *Melanitis* sp. nov? (or *M. leda* variety?)

In the list the female described was wrongly attributed to sp. *phedima*. It is obvious from further specimens of both sexes caught in August at Walayar, near Coimbatore, that it is *zitenius*, and apparently a very distinct subspecies. (See the description given in the list, the male being very similar but differing in shape. See also illustration in vol. xlv).

On the Mettupalaiyam Ghat in the wet season at the end of the year there is a very common *Melanitis* similar to *M. leda* D.S.F. but larger, brighter above, and more deeply and distinctly marked below. This flies together with *M. leda* W.S.F. In the list this species was attributed, perhaps nonsensically, but by a process of elimination, to *M. zitenius*. In the dry season only the D.S.F. of *leda* apparently is to be found. What is this species . . . a variety of *leda* or a distinct species?

A detailed study of the imagines and larvae of the local *Melanitis* would probably repay anyone who had the time for it.

297. *Nacaduba pactolus continentalis*: Recorded from Wenlock Bridge, Kallar and the Nadgani Ghat in July and August. (Sanders).

298. *Thaduka multicaudata kanara*: Foot of the W. slopes in May and January. Silent Valley in the same months. (Pringle).

299. *Pratapa deva deva*: Below Coonor and at Kallar in July and August. (Sanders).

300. *Tajuria jehana*: Mr. Wenlock Bridge in July or August on Loranthus (Sanders). Tiger Hill, May. (Rawlins).

301. *Tagiades distans*: Major Emmet pointed out to me that *T. distans* apparently is found in the Nilgiris and is not uncommon. On examining my specimens of *T. obscuros athos*, two from Kallar certainly answer superficially to *T. distans*. Emmet has specimens from the Nilgiris and the Palnis and he informs me that he has examined the clasps of the latter and they answer to the description of the clasps of *T. distans* given by Ormiston in his 'Butterflies of Ceylon'.

302. *Halpe moorei moorei*: Sigur Ghat in December (Emmet).

Local *Padraona*:—

279. *Padraona cato cato*.
280. *Padraona pseudomaesa pseudomaesa*.
303. *Padraona tropica diana*.
304. *Padraona palnia palnia*.

*Cato* is abundant on the Nadgani Ghat in October. Also recorded from Singara in December and the Mettupalaiyam Ghat in February.

*Pseudomaesa* from Singara in December, *tropica* from the

Nadgani Ghat in October and from the plateau. *Palua* from the plateau.

Additional information on recorded species:—

11. *Papilio buddha*: Mid-Nadgani Ghat in September.
74. *Mycalasis visala visala*: Common at Guddalur in the autumn.
101. *Euripus consimilis meridionalis*: Two females from Kallar. (Sanders).
108. *Limenitis procris undifragus*: Nadgani Ghat in September and July. Silent Valley in May. By the Moyar River in December. (Pringle).
160. *Megisba malaya thwaitesi*: Kallar, 24th July 1945.
183. *Nacaduba helicon viola*: Nadgani Ghat in September.
- (188. *Nacaduba noreia hampsoni*: Major Maitland Emmet caught a good series of these at the foot of the Coolie Ghat in the Palnis in May of this year. This is, of course, outside the Nilgiris, but an interesting record).
193. *Iraota timoleon arsaces*: Kallar, July or August. (Sanders). Foot of Nadgani Ghat, May. (Pringle).
194. *Horsfieldia anita dina*: Near Coimbatore. (Pringle). Gudalur in December. (Emmet).
196. *Amblypodia centaurus pirama*: Kallar, July or August. (Sanders).
200. *Surendra todara todara*: Below Coonoor. (De Nicéville). Nadgani Ghat in July or August. (Sanders).
204. *Spindasis abnormis*: Several records from Coonoor. (Florence).
209. *Pratapa cleobis*: Gudalur Dak Bungalow, below Coonoor, and from Wellington, in July and August. (Sanders).
211. *Tajuria cippus cippus*: Can be obtained on Loranthus below Wenlock Bridge and at Kallar in July and August. (Sanders).
213. *Cheritra fraja jaffra*: Nadgani Ghat in September.
215. *Horaga onyx cingalensis*: Can be caught near Sultan's Battery in January. Local.
217. *Catapoecilma elegans myosilina*: St. Catherine's Falls, Kottagiri, in December. (Emmet).
219. *Zeltus etolus*: Nadgani Ghat in September.
227. *Bindahara phocides moorei*: ♂ ♀ Kallar in May. (Emmet).
253. *Baracus vittatus subditus*: Dimbum Ghat in July. (Pringle).

Errata:—

203. *Spindasis schistacea*. 251. *Astichopterus jama mercara*. There are no records of these species: remarks apply to *S. vulcanus* and to *S. pulligo* respectively.

262. *Notocrypta paralyos alysia*: Hampson's is the only record I can find. My remarks apply to *N. curvifasciata*.

KETTI.

M. A. WYNTER-BLYTH, M.A. (Cantab.)

July 1945.

## 18.—TWO BURMESE SPIDERS WHICH MIMIC SCORPIONS.

(With 2 plates).

The area of country close to Tongup, Burma is very rich in spiders. During a period of three weeks in that area I collected over seventy different species including the following two scorpion mimics.

These are apparently allied to the Genus *Araneus*, but as I have as yet been unable to identify them the following is an ecological description only. In these numbers the tip of the abdomen is elongated to form a scorpion-like 'sting'. The first two pairs of legs are larger than the hind two pairs, the femur being relatively large. Just as the mimicry of the ant-mimic genera *Myrmarachne* and *Amyclaea* is partially dependent upon the antennae-like waving of the first pair of legs, and by the ant-like movement of the spider, so scorpion-mimicry of these two species is dependent upon the aggressive attitude adopted by the spider when it falls to the ground on being disturbed in its web. Most members of the genus *Araneus* 'sham death' when they fall to the ground, but these two species curl the tip of the abdomen forward over the cephalothorax and hold the first two legs on each side close together, and straight forward, appearing very like the pincers of a scorpion.

Both these spiders spin simple orb webs about eight inches in diameter, which are found under shrubs and trees in a vertical position.

The web of the yellow species is found amongst small shrubs with a yellow flower. When I saw this spider I thought that it was a dried petal hanging in a web. The spider rests just above the centre of its web with its abdomen flat against the webbing, quite un-scorpion like in this position. Dried cast skins and petals are also found in the web providing what Hingston terms 'Decoy Devise' protection. When the web is touched the spider drops to the ground and adopts the scorpion mimic attitude described above. This will give protection due to the apparent rapid change in form just as a rapid change in colour gives 'Flash colouration' protection.

The red species is found beneath trees with very finely divided compound leaves, the dried leaflets of which are reddish brown in colour. These dried leaflets are found in the web as 'decoys'. The spider rests in the centre of the web, the flattened tail being apparently the stem of a leaflet. When the web is touched the spider drops as the yellow species does.

In this area I found many species of *Araneus*, very dried-leaf like in form when they are seen hanging in the web, or more usually resting at the side, but the above two are the only mimetic forms which I have found in Burma.

The mimetic protection obtained by these spiders is due entirely to their scorpion-like form and attitude when on the ground. They do not receive protection because they are found